इंटरनेट मानक

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IS 4215 (1983): Ring Type Needle Bearings [PGD 13: Bearing]

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IS : 4215 - 1983

Indian Standard

(Reaffirmed 2006)

SPECIFICATION FOR RING TYPE NEEDLE BEARINGS

(First Revision)

Rolling Bearing Sectional Committee, EDC 39; Panel for Needle Bearing EDC 39/P-3 [Ref : Doc : EDC 39 (3667)]

1. Scope — Covers the requirements of needle bearings, having thick rings, used for high loads and speeds.

2. Types — Needle bearings covered in this standard shall be of the following types :

a) Radial needle bearings with either cage guided needles or full complement retained needles (*see* **5.1**, **5.2**, **5.3** and **5.5**).

b) Needle thrust bearings (*see* **5.6**).

c) Combined (radial and thrust) needle bearings (*see* **5.7**).

3. Material

3.1 The material for inner, outer and thrust plates used for needle bearings covered in this standard may be any suitable bearing steel. Suitable example is carbon-chromium steel of IS : 4398-1972 'Specification for carbon-chromium steel for the manufacture of balls, rollers and bearing races (*first revision*)'.

3.2 The needle rollers used for needle bearings shall conform to IS : 4217-1981 'Specifications for needle rollers (*first revision*)'.

3.3 The material of cages used for needle bearings may be a suitable cold-rolled carbon steel, such as covered under IS : 4397-1972 'Specification for cold rolled carbon steel strips for ball and roller bearing cages (*first revision*)'.

4. Hardness — Rings in the needle bearings shall have hardness of 58 to 64 *HRC* when determined in accordance with IS : 1586-1968 'Method for Rockwell hardness test (B and C scales) for steels (*first revision*)'.

5. Dimensions and Tolerances

5.1 Boundary dimensions for radial, cage guided needle bearings without inner rings shall be as given in Table 1.

5.2 Boundary dimensions for radial, cage guided needle bearings with inner rings shall be as given in Table 2.

5.3 Boundary dimensions for full complement retained needles, radial needle bearings without inner rings shall be as given in Table 3.

5.4 Boundary dimensions for full complement retained needles, radial needle bearings with inner rings shall be as given in Table 4.

5.5 Boundary dimensions for full complement retained needles, radial inverted needle bearings without outer rings shall be as given in Table 5.

5.6 Boundary dimensions for needle thrust bearings, needle thrust bearings with additional thrust plate and separate thrust plates for needle thrust bearings shall be as given in Table 6.

5.7 Boundary dimensions for combined needle bearings, combined needle bearings with additional thrust plates and inner rings for combined needle bearings shall be as given in Table 7.

5.8 Dimensional tolerances for needle bearing covered in this standard shall be as given in Table 8.

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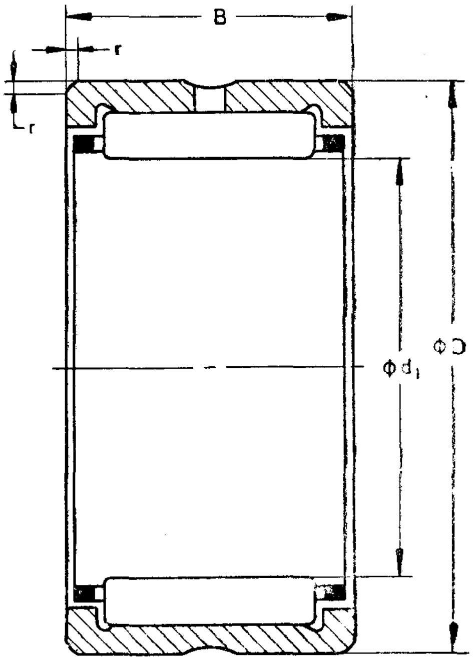
INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

TABLE 1 BOUNDARY DIMENSIONS FOR CAGE GUIDED, RADIAL NEEDLE BEARINGS WITHOUT INNER RINGS

(*Clause* 5.1)

All dimensions in millimetres.

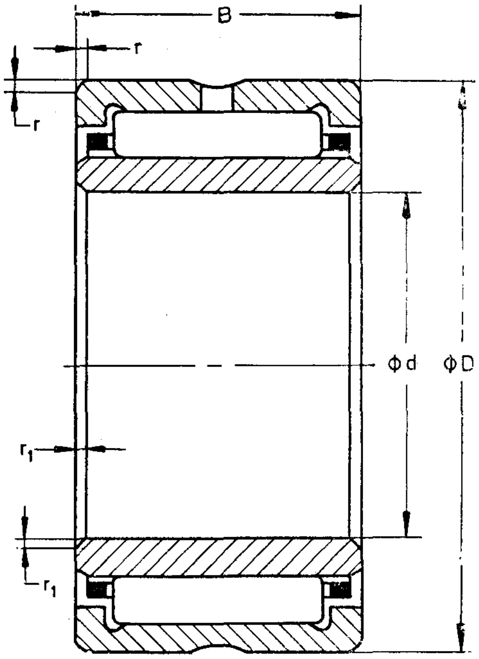


Type and Designation	d_1 F6	*D*	*B*	*r*
NB 7 14 12	7	14	12	0·35
NB 8 15 12	8	15	12	0·35
NB 9 16 12	9	16	12	0·35
NB 9 16 16	9	16	16	0·35
NB 10 17 12	10	17	12	0·35
NB 10 17 16	10	17	16	0·35
NB 12 19 12	12	19	12	0·35
NB 12 19 16	12	19	16	0·35
NB 14 22 16	14	22	16	0·35
NB 15 23 16	15	23	16	0·35
NB 16 24 16	16	24	16	0·35
NB 18 26 16	16	26	16	0·35
NB 19 27 16	19	27	16	0·35
NB 19 27 20	19	27	20	0·35
NB 20 28 16	20	28	16	0·35
NB 20 28 20	20	28	20	0·35
NB 21 29 16	21	29	16	0·35
NB 21 29 20	21	29	20	0·35
NB 22 30 16	22	30	16	0·35
NB 22 30 20	22	30	20	0·35
NB 24 32 16	24	32	16	0·35
NB 24 32 20	24	32	20	0·35
NB 25 33 16	25	33	16	0·35
NB 25 33 20	25	33	20	0·35
NB 26 34 20	26	34	20	0·35
NB 28 37 20	25	37	20	0·35
NB 29 38 20	29	38	20	0·35
NB 29 38 30	29	38	30	0·35
NB 30 40 20	30	40	20	0·35
NB 30 40 30	30	40	30	0·35
NB 32 42 30	32	42	20	0·35
NB 32 42 30	32	42	30	0·35
NB 35 45 20	35	45	20	0·35
NB 35 45 30	35	45	30	0·35
NB 37 47 20	37	47	20	0·35
NB 38 48 20	38	48	20	0·35
NB 40 50 20	40	50	20	0·35
NB 40 50 30	40	50	30	0·35
NB 42 52 20	42	52	20	0·35
NB 45 55 20	45	55	20	0·35
NB 45 55 30	45	55	30	0·35
NB 47 57 20	47	57	20	0·35
NB 50 62 25	50	62	25	0·65
NB 50 62 35	50	62	35	0·65
NB 55 68 25	55	68	25	0·65
NB 55 68 35	55	68	35	0·65
NB 60 72 25	60	72	25	0·65
NB 60 72 35	60	72	35	0·65
NB 65 78 25	65	78	25	0·85
NB 65 78 35	65	78	35	0·85
NB 68 82 25	68	82	25	0·85
NB 68 82 35	68	82	35	0·85
NB 70 85 25	70	85	25	0·85
NB 70 85 35	70	85	35	0·85
NB 73 90 35	73	90	35	0·85
NB 75 92 25	75	92	25	0·85
NB 75 92 35	75	92	35	0·85
NB 80 95 25	80	95	25	1·35
NB 80 95 35	80	95	35	1·35
NB 80 100 35	80	100	35	1·35
NB 85 105 35	85	105	35	1·35
NB 90 110 25	90	110	25	1·35
NB 90 110 35	90	110	35	1·35
NB 95 115 26	95	115	26	1·35
NB 95 115 36	95	115	36	1·35
NB 100 120 26	100	120	26	1·35
NB 100 120 36	100	120	36	1·35
NB 105 125 26	105	125	26	1·35
NB 107 125 32	107	125	32	1·35
NB 110 130 30	110	130	30	1·35

TABLE 2 BOUNDARY DIMENSIONS FOR CAGE GUIDED, RADIAL NEEDLE BEARINGS WITH INNER RINGS

(*Clause* 5.2)

All dimensions in millimetres.

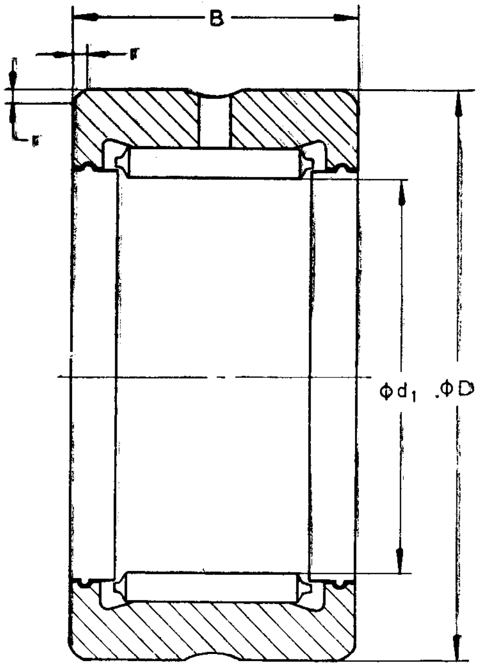


Type and Designation	*d*	*D*	*B*	*r*	r_1
NBI 5 15 12	5	15	12	0·35	0·20
NBI 6 16 12	6	16	12	0·35	0·20
NBI 6 16 16	6	16	16	0·35	0·20
NBI 7 17 12	7	17	12	0·35	0·20
NBI 7 17 16	7	17	16	0·35	0·20
NBI 9 19 12	9	19	12	0·35	0·20
NBI 9 19 16	9	19	16	0·35	0·20
NBI 10 22 16	10	22	16	0·35	0·30
NBI 12 23 16	12	23	16	0·35	0·20
NBI 12 24 16	12	24	16	0·35	0·30
NBI 13 26 16	13	26	16	0·35	0·35
NBI 15 27 16	15	27	16	0·35	0·30
NBI 15 27 20	15	27	20	0·35	0·30
NBI 15 28 16	15	28	16	0·35	0·35
NBI 15 28 20	15	28	20	0·35	0·35
NBI 17 29 16	17	29	16	0·35	0·30
NBI 17 29 20	17	29	20	0·35	0·30
NBI 17 30 16	17	30	16	0·35	0·35
NBI 17 30 20	17	30	20	0·35	0·35
NBI 20 32 16	20	32	16	0·35	0·30
NBI 20 32 20	20	32	20	0·35	0·30
NBI 20 33 16	20	33	16	0·35	0·35
NBI 20 33 20	20	33	20	0·35	0·35
NBI 22 34 20	22	34	20	0·35	0·30
NBI 23 37 20	23	37	20	0·35	0·35
NBI 25 38 20	25	38	20	0·35	0·30
NBI 25 38 30	25	38	30	0·35	0·30
NBI 25 40 20	25	40	20	0·35	0·35
NBI 25 40 30	25	40	30	0·35	0·35
NBI 28 42 20	28	42	20	0·35	0·30
NBI 28 42 30	28	42	30	0·35	0·30
NBI 30 45 20	30	45	20	0·35	0·35
NBI 30 45 30	30	45	30	0·35	0·35
NBI 32 47 20	32	47	20	0·35	0·35
NBI 33 48 20	33	48	20	0·35	0·35
NBI 35 50 20	35	50	20	0·35	0·35
NBI 35 50 30	35	50	30	0·35	0·35
NBI 37 52 20	37	52	20	0·35	0·35
NBI 40 55 20	40	55	20	0·35	0·35
NBI 40 55 30	40	55	30	0·35	0·35
NBI 42 57 20	42	57	20	0·35	0·35
NBI 45 62 25	45	62	25	0·65	0·65
NBI 45 62 35	45	62	35	0·65	0·65
NBI 50 68 25	50	68	25	0·65	0·65
NBI 50 68 35	50	68	35	0·65	0·65
NBI 55 72 25	55	72	25	0·65	0·65
NBI 55 72 35	55	72	35	0·65	0·65
NBI 58 78 25	58	78	25	0·85	0·85
NBI 58 78 35	58	78	35	0·85	0·85
NBI 60 82 25	60	82	25	0·85	0·85
NBI 60 82 35	60	82	35	0·85	0·85
NBI 62 85 25	62	85	25	0·85	0·85
NBI 62 85 35	62	85	35	0·85	0·85
NBI 65 90 35	65	90	35	0·85	0·85
NBI 67 92 25	67	92	25	0·85	0·85
NBI 67 92 35	67	92	35	0·85	0·85
NBI 70 95 25	70	95	25	1·35	1·35
NBI 70 95 35	70	95	35	1·35	1·35
NBI 70 100 35	70	100	35	1·35	1·35
NBI 75 105 35	75	105	35	1·35	1·35
NBI 80 110 25	80	110	25	1·35	1·35
NBI 80 110 35	80	110	35	1·35	1·35
NBI 85 115 26	85	115	26	1·35	1·35
NBI 85 115 36	85	115	36	1·35	1·35
NBI 90 120 26	90	120	26	1·35	1·35
NBI 90 120 36	90	120	36	1·35	1·35
NBI 95 123 26	95	125	26	1·35	1·35
NBI 95 125 32	95	125	32	1·35	1·35
NBI 100 130 30	100	130	30	1·35	1·35

TABLE 3 BOUNDARY DIMENSIONS FOR FULL COMPLEMENT RETAINED NEEDLES, RADIAL NEEDLE BEARINGS WITHOUT INNER RINGS

(*Clause* 5.3)

All dimensions in millimetres.

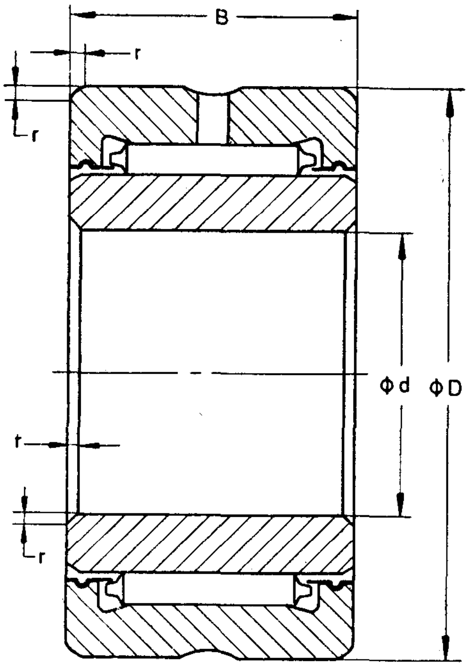


Light Series				Medium Series				Heavy Series				
Type and Designation	d_1 F6	*D*	*B*	Type and Designation	d_1 F6	*D*	*B*	Type and Designation	d_1 F6	*D*	*B*	*r*
RNA 10 12	17·6	28	15									0·35
RNA 10 15	20·8	32	15	RNA 20 15	22·1	35	22					0·65
RNA 10 17	23·9	35	15									0·65
RNA 10 20	28·7	42	18	RNA 20 20	28·7	42	22					0·65
RNA 10 25	33·5	47	18	RNA 20 25	33·5	47	22					0·65
RNA 10 30	38·2	52	18	RNA 20 30	38·2	52	22	RNA 30 30	44	62	30	0·65
RNA 10 35	44	58	18	RNA 20 35	44	58	22	RNA 30 35	49·7	72	36	0·65
RNA 10 40	49·7	65	18	RNA 20 40	49·7	65	22	RNA 30 40	55·4	80	36	0·85
RNA 10 45	55·4	72	18	RNA 20 45	55·4	72	22	RNA 30 45	62·1	85	38	0·85
RNA 10 50	62·1	80	20	RNA 20 50	62·1	80	28	RNA 30 50	68·8	90	38	0·85
RNA 10 55	68·8	85	20	RNA 20 55	68·8	85	28	RNA 30 55	72·6	95	38	0·85
RNA 10 60	72·6	90	20	RNA 20 60	72·6	90	28	RNA 30 60	78·3	100	38	0·85
RNA 10 65	78·3	95	20	RNA 20 65	78·3	95	28	RNA 30 65	83·1	105	38	0·85
RNA 10 70	83·1	100	20	RNA 20 70	83·1	100	28	RNA 30 70	88	110	38	0·85
RNA 10 75	88·0	110	24	RNA 20 75	88	110	32	RNA 30 75	96	120	38	0·85
RNA 10 80	96·0	115	24	RNA 20 80	96	115	32	RNA 30 80	99·5	125	38	0·85
				RNA 20 85	99·5	120	32	RNA 30 85	104·7	130	38	1·35
				RNA 20 90	104·7	125	32	RNA 30 90	109·1	135	43	1·35
				RNA 20 95	109·1	130	32	RNA 30 95	114·7	140	43	1·35
				RNA 21 00	114·7	135	32	RNA 31 00	119·2	145	43	1·35
				RNA 21 05	119·2	140	32	RNA 31 05	124·7	150	45	1·35
				RNA 21 10	124·7	145	34	RNA 31 10	132·5	160	45	1·35
				RNA 21 15	132·5	155	34	RNA 31 15	137	165	45	1·35
				RNA 21 20	137	160	34	RNA 31 20	143·5	170	45	1·35
				RNA 21 25	143·5	165	34	RNA 31 25	152·8	185	52	1·35
				RNA 21 30	148	170	34	RNA 31 30	158	190	52	1·35
				RNA 21 40	158	180	36	RNA 31 40	170·5	205	52	1·35
				RNA 21 50	170·5	195	36	RNA 31 50	179·3	215	52	1·35
				RNA 21 60	179·3	205	36	RNA 31 60	193·8	230	57	1·35
				RNA 21 70	193·8	220	42	RNA 31 70	202·6	245	57	1·85
				RNA 21 80	202·6	230	42	RNA 31 80	216	255	57	1·85
				RNA 21 90	216	245	42	RNA 31 90	224·1	265	57	1·85
				RNA 22 00	224·1	255	42	RNA 32 00	236	280	57	1·85
				RNA 22 10	236	265	42	RNA 32 10	248·4	290	64	1·85
				RNA 22 20	248·4	280	49	RNA 32 20	258·4	300	64	1·85
				RNA 22 30	258·4	290	49	RNA 32 30	269·6	315	64	1·85
				RNA 22 40	269·6	300	49	RNA 32 40	281·9	325	64	1·85
				RNA 22 50	281·9	315	49	RNA 32 50	290·5	340	74	1·85
				RNA 22 60	290·5	325	54	RNA 32 60	302	350	74	1·85
				RNA 22 70	302	340	54	RNA 32 70	313·5	365	74	1·85
				RNA 22 80	313·5	350	54	RNA 32 80	325	375	74	1·86
				RNA 22 90	325	365	54	RNA 32 90	335	385	74	1·85
				RNA 23 00	335	375	54	RNA 33 00	344	395	74	1·85

TABLE 4 BOUNDARY DIMENSIONS FOR FULL COMPLEMENT RETAINED NEEDLES, RADIAL NEEDLE BEARINGS WITH INNER RINGS

(*Clause* 5.4)

All dimensions in millimetres.

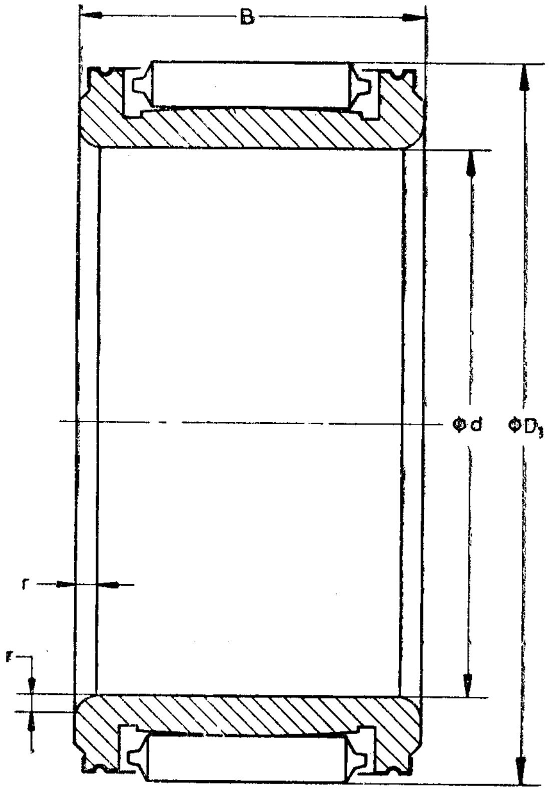


Light Series				Medium Series				Heavy Series				
Type and Designation	*d*	*D*	*B*	Type and Designation	*d*	*D*	*B*	Type and Designation	*d*	*D*	*B*	*r*
NA 10 12	12	28	15									0·35
NA 10 15	15	32	15	NA 20 15	15	35	22					0·65
NA 10 17	17	35	15									0·65
NA 10 20	20	42	18	NA 20 20	20	42	22					0·65
NA 10 25	25	47	18	NA 20 25	25	47	22					0·65
NA 10 30	30	52	18	NA 20 30	30	52	22	NA 30 30	30	62	30	0·65
NA 10 35	35	58	18	NA 20 35	35	58	22	NA 30 35	35	72	36	0·65
NA 10 40	40	65	18	NA 20 40	40	65	22	NA 30 40	40	80	36	0·85
NA 10 45	45	72	18	NA 20 45	45	72	22	NA 30 45	45	85	38	0·85
NA 10 50	50	80	20	NA 20 50	50	80	28	NA 30 50	50	90	38	0·85
NA 10 55	55	85	20	NA 20 55	55	85	28	NA 30 55	55	95	38	0·85
NA 10 60	60	90	20	NA 20 60	60	90	28	NA 30 60	60	100	38	0·85
NA 10 65	65	95	20	NA 20 65	65	95	28	NA 30 65	65	105	38	0·85
NA 10 70	70	100	20	NA 20 70	70	100	28	NA 30 70	70	110	38	0·85
NA 10 75	75	110	24	NA 20 75	75	110	32	NA 30 75	75	120	38	0·85
NA 10 80	80	115	24	NA 20 80	80	115	32	NA 30 80	80	125	38	0·85
				NA 20 85	85	120	32	NA 30 85	85	130	38	1·35
				NA 20 90	90	125	32	NA 30 90	90	135	43	1·35
				NA 20 95	95	130	32	NA 30 95	95	140	43	1·35
				NA 21 00	100	135	32	NA 31 00	100	145	43	1·35
				NA 21 05	105	140	32	NA 31 05	105	150	45	1·35
				NA 21 10	110	145	34	NA 31 10	110	160	45	1·35
				NA 21 15	115	155	34	NA 31 15	115	165	45	1·35
				NA 21 20	120	160	34	NA 31 20	120	170	45	1·35
				NA 21 25	125	165	34	NA 31 25	125	185	52	1·35
				NA 21 30	130	170	34	NA 31 30	130	190	52	1·35
				NA 21 40	140	180	36	NA 31 40	140	205	52	1·35
				NA 21 50	150	195	36	NA 31 50	150	215	52	1·35
				NA 21 60	160	205	36	NA 31 60	160	230	57	1·35
				NA 21 70	170	220	42	NA 31 70	170	245	57	1·85
				NA 21 80	180	230	42	NA 31 80	180	255	57	1·85
				NA 21 90	190	245	42	NA 31 90	190	265	57	1·85
				NA 22 00	200	255	42	NA 32 00	200	280	57	1·85
				NA 22 10	210	265	42	NA 32 10	210	290	64	1·85
				NA 22 20	220	280	49	NA 32 20	220	300	64	1·85
				NA 22 30	230	290	49	NA 32 30	230	315	64	1·85
				NA 22 40	240	300	49	NA 32 40	240	325	64	1·85
				NA 22 50	250	315	49	NA 32 50	250	340	74	1·85
				NA 22 60	260	325	54	NA 32 60	260	350	74	1·85
				NA 22 70	270	340	54	NA 32 70	270	365	74	1·85
				NA 22 80	280	350	54	NA 32 80	280	375	74	1·85
				NA 22 90	290	365	54	NA 32 90	290	385	74	1·85
				NA 23 00	300	375	54	NA 33 00	300	395	74	1·85

TABLE 5 BOUNDARY DIMENSIONS FOR FULL COMPLEMENT RETAINED NEEDLES, RADIAL, INVERTED NEEDLE BEARINGS WITHOUT OUTER RINGS

(*Clause* 5.5)

All dimensions in millimetres.

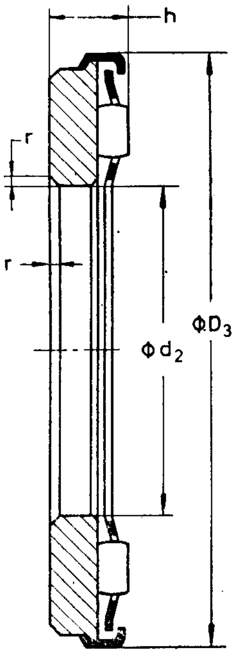


Type and Designation	*d*	*D_1* h6	*B*	*r*
NAW 22 28 R6	22	36·5	28	0·35
NAW 25 18 R6	25	39·5	18	0·85
NAW 35 18 R6	35	46·4	18	0·85
NAW 35 22 R6	35	46·4	22	0·85
NAW 35 28 R6	35	46·4	28	0·85
NAW 35 38 R6	35	52	38	0·85
NAW 40 18 R6	40	55·72	18	1·3
NAW 45 20 R6	45	62·4	20	1·3
NAW 55 20 R6	55	72·9	20	1·3
NAW 70 22 R6	70	90·1	22	1·3
NAW 82 22 R6	82	102·4	22	1·3

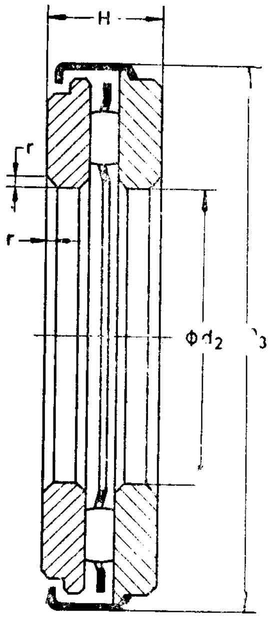
TABLE 6 BOUNDARY DIMENSIONS FOR NEEDLE THRUST BEARINGS, NEEDLE THRUST BEARINGS WITH ADDITIONAL THRUST PLATE AND SEPARATE THRUST PLATES

(*Clause* 5.6)

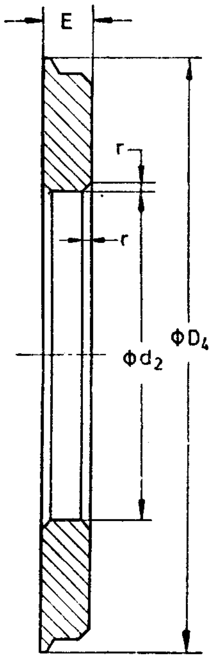
All dimensions in millimetres.



Needle Thrust Bearings



Needle Thrust Bearings with Additional Thrust Plate



Separate Thrust Plates

Type and Designation	d_2 H10	D_3 e10	h ±0·1
AX3·5 5 13	5	13	3·5
AX3·5 6 14	6	14	3·5
AX3·5 7 15	7	15	3·5
AX3·5 8 16	8	16	3·5
AX3·5 9 17	9	17	3·5
AX4 10 22	10	22	4
AX4 12 26	12	26	4
AX4 13 26	13	26	4
AX4 15 28	15	28	4
AX4 17 30	17	30	4
AX4 19 32	19	32	4
AX5 20 35	20	35	5
AX5 25 42	25	42	5
AX5 30 47	30	47	5
AX5 35 52	35	52	5
AX5 35 53	35	53	5
AX5 40 60	40	60	5
AX5 45 65	45	65	5
AX5 50 70	50	70	5
AX6 55 78	55	78	6
AX6 60 85	60	85	6
AX6 65 90	65	90	6
AX6 70 95	70	95	6

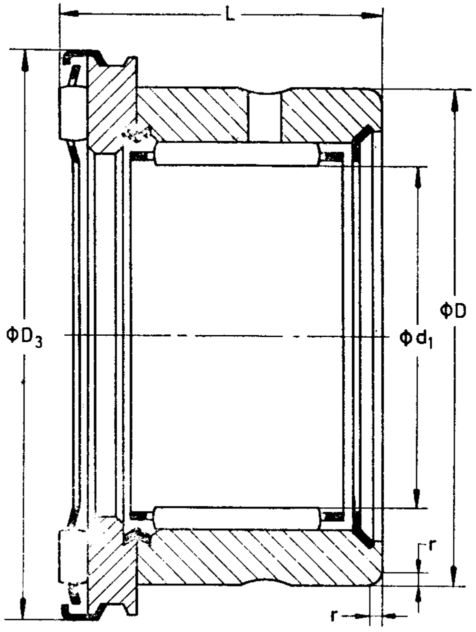
Type and Designation	d_2 H10	D_3 e10	H ±0·1
AXZ5·5 5 13	5	13	5·5
AXZ5·5 6 14	6	14	5·5
AXZ5·5 7 15	7	15	5·5
AXZ5·5 8 16	8	16	5·5
AXZ5·5 9 17	9	17	5·5
AXZ6 10 22·4	10	22·4	6
AXZ6 12 26·4	12	26·4	6
AXZ6 13 26·4	13	26·4	6
AXZ6 15 26·4	15	28·4	6
AXZ6 17 30·4	17	30·4	6
AXZ6 19 32·4	19	32·4	6
AXZ8 20 35·4	20	35·4	8
AXZ8 25 43	25	43	8
AXZ8 30 48	30	48	8
AXZ8 35 53	35	53	8
AXZ8 35 54	35	54	8
AXZ8 40 61	40	61	8
AXZ8 45 66	45	66	8
AXZ8 50 71	50	71	8
AXZ8 55 79	55	79	8
AXZ10 60 86	60	86	10
AXZ10 65 91	65	91	10
AXZ10 70 96	70	96	10

Type and Designation	d_2 H10	D_4 h8	E ±0·05	r
CP2 5 13	5	12·4	2	0·35
CP2 6 14	6	13·4	2	0·35
CP2 7 15	7	14·4	2	0·35
CP2 8 16	8	15·4	2	0·35
CP2 9 17	9	16·4	2	0·35
CP2 10 22	10	21·5	2	0·5
CP2 12 26	12	25·5	2	0·5
CP2 13 26	13	25·5	2	0·5
CP2 15 28	15	27·5	2	0·5
CP2 17 30	17	29·5	2	0·5
CP2 19 32	19	31·5	2	0·5
CP3 20 35	20	34·5	3	0·8
CP3 25 42	25	41·5	3	0·8
CP3 30 47	30	46·5	3	0·8
CP3 35 52	35	51·5	3	0·8
CP3 35 53	35	52·5	3	0·8
CP3 40 60	40	59·5	3	0·8
CP3 45 65	45	64·4	3	0·8
CP3 50 70	50	69·4	3	0·8
CP4 55 78	55	77·4	4	1·2
CP4 60 85	60	84·3	4	1·2
CP4 65 90	65	89·3	4	1·2
CP4 70 95	70	94·3	4	1·2

TABLE 7 BOUNDARY DIMENSIONS FOR COMBINED NEEDLE BEARINGS, COMBINED NEEDLE BEARINGS WITH ADDITIONAL THRUST PLATE AND INNER RINGS FOR COMBINED NEEDLE BEARINGS

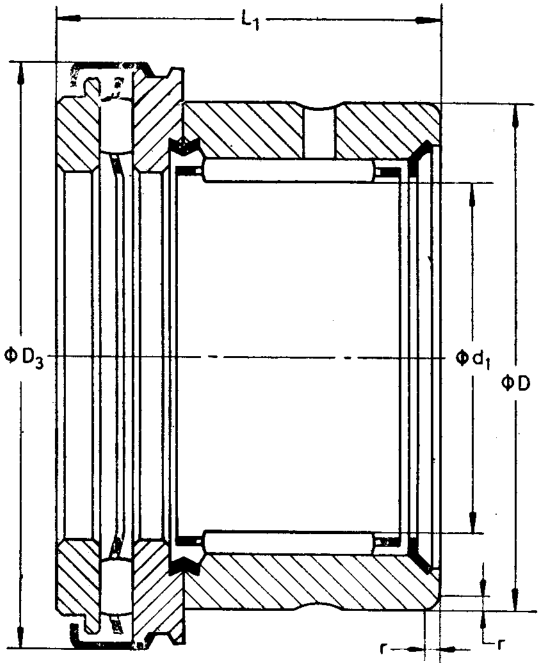
(*Clause* 5.7)

All dimensions millimetres.



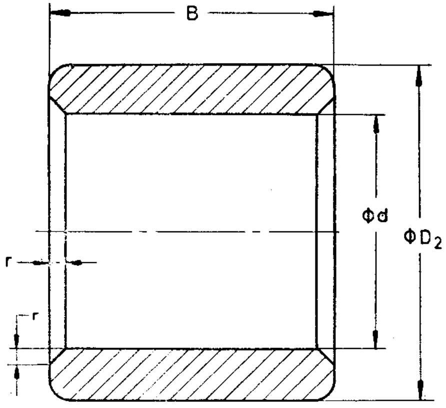
Combined Needle Bearings

Type and Designation RAX 400	d_1 F6	D	D_3 e10	L $^{0}_{-0·25}$	r
RAX 410	10	19	22	19	0·35
RAX 412	12	21	26	19	0·35
RAX 415	15	24	23	19	0·35
RAX 417	17	26	30	21	0·65
RAX 420	20	30	35	24	0·85
RAX 425	25	37	42	24	0·85
RAX 430	30	42	47	24	0·85
RAX 435	35	47	53	24	0·85
RAX 440	40	52	60	24	0·85
RAX 445	45	58	65	24	0·85
RAX 450	50	62	70	27	1·3
RAX 460	60	72	85	28	1·3
RAX 470	70	85	95	28	1·3

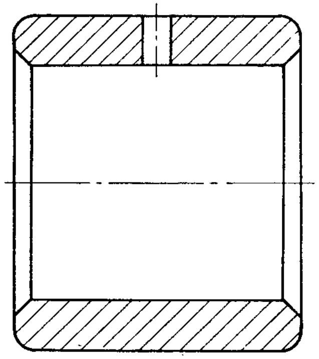


Combined Needle Bearings with Additional Thrust Plate

Type and Designation RAXZ 400	d_1 F6	D	D_3 e10	L_1 $^{0}_{-0·25}$	r
RAXZ 410	10	19	2·4	21	0·35
RAXZ 412	12	21	26·4	21	0·35
RAXZ 415	15	24	28·4	21	0·35
RAXZ 417	17	26	30·4	23	0·65
RAXZ 420	20	30	35·4	27	0·85
RAXZ 425	25	37	43	27	0·85
RAXZ 430	30	42	48	27	0·85
RAXZ 435	35	47	54	27	0·85
RAXZ 440	40	52	61	27	0·85
RAXZ 445	45	53	66	27	0·85
RAXZ 450	50	62	71	30	1·3
RAXZ 460	60	72	86	32	1·3
RAXZ 470	70	85	96	32	1·3



IM.....P



IMC.....P

Inner Rings For Combined Needle Bearings

Type and Designation IM......P	d	D_2 h5	B	r
IM 7 10 16 P	7	10	16	0·2
IM 9 12 16 P	9	12	16	0·2
IM 12 15 16 P	12	15	16	0·2
IM 14 17 17 P	14	17	17	0·2
IM 15 20 20 P	15	20	20	0·35
IM 20 25 20 P	20	25	20	0·35
IM 25 30 20 P	25	30	20	0·35
IM 30 35 20 P	30	35	20	0·35
IM 35 40 20 P	35	40	20	0·35
IM 40 45 20 P	40	45	20	0·35
IM 45 50 25 P	45	50	25	0·65
IM 55 60 25 P	55	60	25	0·65
IM 60 70 25 P	60	70	25	0·85

TABLE 8 DIMENSIONAL TOLERANCE FOR NEEDLE BEARINGS

(*Clause* 5.8)

Deviations in µm (1µm : 0·001 mm)

Nominal Dia (mm)		Bore					Outer Dia					Width		
		dm		*d**		Radial Run-out	*Dm*		*D**		Radial Run-out	*B*		Variations of Individual Ring
		Deviations					Deviations					Deviations		
Over	Including	High	Low	High	Low	Max	High	Low	High	Low	Max	High	Low	Max
6	18	0	−8	+3	−11	10	0	−8	+2	−10	15	0	−120	20
18	30	0	−10	+3	−13	13	0	−9	+2	−11	15	0	−120	20
30	50	0	−12	+3	−15	15	0	−11	+3	−14	20	0	−120	20
50	80	0	−15	+4	−19	20	0	−13	+4	−17	25	0	−150	20
80	120	0	−20	+5	−25	25	0	−15	+5	−20	35	0	−200	25
120	150	0	−25	+6	−31	30	0	−18	+6	−24	40	0	−250	25
150	180	0	−25	+6	−31	30	0	−24	+7	−32	45	0	−250	30
180	250	0	−30	+8	−38	40	0	−30	+8	−38	50	0	−300	30
250	315	0	−35	+9	−44	50	0	−35	+9	−44	60	0	−350	35

*The values are valid for two-point measurement only.

6. Designation — Ring type needle bearings shall be designated by their type, boundary dimensions and the number of this standard.

Example :

Type NB — Ring type cage guided radial needle bearing (without inner ring) of 22 mm bore diameter, 30 mm outer diameter and 16 mm width shall be designated as:

NB 22 30 16 IS : 4215

7. Workmanship and Finish

7.1 Needle bearings shall be free from cracks, flaws, corrosion and other injurious defects.

7.2 Mean surface roughness values for rolling tracks of needle bearings shall be as under:

Nominal Diameter (mm)		*Surface Roughness* µm (Ra)	
Above	Up to and Including	Inner Track	Outer Track
—	100	0·35	0·3
100	—	0·5	0·4

8. Packing and Marking — Needle bearings shall be protected from corrosion and suitably packed. The packages shall be marked with designation and manufacturer's symbol or trade-mark.

8.1 *ISI Certification Marking* — Details available with the Indian Standards Institution.

9. Sampling and Inspection — *See* Appendix A.

APPENDIX A

(*Clause* 9)

SAMPLING AND INSPECTION

A-1. Lot — In any consignment, all the needle bearings of the same designation and manufactured under similar conditions of production shall be grouped to constitute a lot.

A-2. Sampling — The number of needle bearings to be selected at random from each lot for inspection shall be according to Table 9. To ensure randomness of selection, IS : 4905-1968 'Methods for random sampling' shall be followed.

TABLE 9 SAMPLING PLAN AND CRITERIA FOR CONFORMITY

Lot Size	Sampling Size	Acceptance Number	Sub-Sample Size
Up to 50	5	0	2
51 to 300	8	0	3
301 to 1 000	12	1	5
1 001 to 3 000	20	1	8
3 001 and above	32	3	13

A-3. Inspection — Random samples selected as in **A-2** shall be inspected for tolerances, workmanship, free rotation and against corrosion as per requirements in this specification. Needle rollers from these samples shall be tested to IS : 4217-1981 'Specification for needle rollers (*first revision*)'. Any needle bearing failing to meet the requirement for any one or more of the above characteristics shall be declared as defective.

A-4. The lot shall be considered conforming to the requirements as in **A-3** if the number of defectives is less than or equal to the corresponding acceptance number in Table 9.

A-5. Hardness Test — If the lot is found satisfactory according to **A-4**, a number of bearings from the sampling size equal to the sub-sample size in Table 9, shall be subjected to hardness test.

A-6. Conformity — The lot shall be considered conforming to the requirements if the total number of defectives under **A-4** and **A-5** is less than or equal to the corresponding acceptance number in Table 9.

EXPLANATORY NOTE

This standard was first published in 1967. At the time of periodic review, the Committee responsible for its preparation, felt it necessary to revise the specification.

Needle bearings are generally used as rolling bearings offering high load carrying capacity with reduced cross-sectional area. In this revision major variations are as follows:

a) The title of the specification has been modified;

b) Various types of needle bearings and their boundary dimensions have been included;

c) Boundary dimensions of inverted type of needle bearings have been modified to sizes in use; and

d) Sampling and inspection clause has been included.

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